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मानक

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IS 8589 (2011): Aircargo Equipment - Interline Pallet Nets
[TED 14: Aircraft and Space Vehicles]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
वायुयान में लदान हेतु उपस्कर — इंटरलाइन प्रपट्टिका नेट
(दूसरा पुनरीक्षण)

Indian Standard
AIR CARGO EQUIPMENT — INTERLINE PALLET NETS
(*Second Revision*)

ICS 55.180.30

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BUREAU OF INDIAN STANDARDS
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NATIONAL FOREWORD

This Indian Standard (Second Revision) which is identical with ISO 4170 : 1995 'Air cargo equipment — Interline pallet nets' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Aircraft, Space Vehicles, Air Cargo Handling and Aircraft Electrical Equipment Sectional Committee and approval of the Transport Engineering Division Council.

This standard was first published in 1977 and revised in 1994 based on ISO 4170 : 1987. The second revision of this standard has been undertaken with a view to bring it in line with the latest version of ISO 4170 : 1995.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 4117 : 1993 Air and air/land cargo pallets — Specification and testing	IS 11499 : 1996 Air and air/land cargo pallets — Specification and testing (<i>first revision</i>)	Identical
ISO 4171 : 1993 Air cargo equipment — Interline pallets	IS 7074 : 1999 Air cargo equipment — Interline pallets (<i>second revision</i>)	do

The technical committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

<i>International/Other Standard</i>	<i>Title</i>
ISO 7166 : 1985	Aircraft — Rail and stud configuration for passenger equipment and cargo restraint
ISO 8097 : 1993	Aircraft — Minimum airworthiness requirements and test conditions for certified air cargo unit load devices
ISO/TR 8647 : 1990	Environmental degradation of textiles used in air cargo restraint equipment
ISO 10046	Aircraft — Methodology of calculating cargo compartment volume
IATA	Unit Load Devices (ULD) Technical Manual

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AIR CARGO EQUIPMENT — INTERLINE PALLET NETS (Second Revision)

1 Scope

This International Standard specifies dimensional, structural and environmental requirements for nets used to secure cargo on aircraft pallets meeting the requirements of ISO 4117 or ISO 4171.

This International Standard establishes six basic sizes of pallet nets, as given in table 1.

Table 1 — Sizes of pallet nets

Net size code (in accordance with ISO 8097 ¹⁾)	Size of corresponding pallet (see ISO 4117 and ISO 4171)	
	mm	in
A	2 235 × 3 175	88 × 125
B	2 235 × 2 743	88 × 108
K	1 534 × 1 562	60,4 × 61,5
L	1 534 × 3 175	60,4 × 125
M	2 438 × 3 175	96 × 125
R	2 438 × 4 978	96 × 196

1) ISO Committee Members are at present voting on adding size code R to ISO 8097:1993.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4117:1993, *Air and air/land cargo pallets — Specification and testing*.

ISO 4171:1993, *Air cargo equipment — Interline pallets*.

ISO 7166: 1985, *Aircraft — Rail and stud configuration for passenger equipment and cargo restraint*.

ISO 8097:1993, *Aircraft — Minimum airworthiness requirements and test conditions for certified air cargo unit load devices*.

ISO/TR 8647:1990, *Environmental degradation of textiles used in air cargo restraint equipment*.

ISO 10046:—¹⁾, *Aircraft — Methodology of calculating cargo compartment volume*.

IATA, *Unit Load Devices (ULD) Technical Manual*, 8th edition²⁾.

3 Basic requirements

3.1 Configuration

The net assembly shall include netting, adjustment hardware and pallet attachment fittings. (See figure 1.)

3.2 Construction

3.2.1 Weatherproofing

Net construction shall be rugged and weather-resistant, thus minimizing maintenance and original cost.

3.2.2 Fittings and appurtenances

All fittings and appurtenances shall be within the maximum allowable contour appropriate to the aircraft installation. The thickness of the fittings and appurtenances between the heights of 150 mm and 760 mm above the top of the base shall not exceed 50 mm; elsewhere the thickness shall not exceed 25 mm.

NOTE 1 The IATA *ULD Technical Manual* may be referred to for specific contours.

1) To be published.

2) Available from International Air Transport Association, 2000 Peel Street, Montreal, Canada H3A 2R4 or Route de l'Aéroport 33, Case postale 672, 1215 Geneva 15, Switzerland.

3.2.3 Structural strength

Net construction shall have sufficient structural strength

- a) to withstand, without permanent detrimental deformation, the static loads and impact shock encountered in normal carrier service;
- b) in combination with the complementary pallet, to retain the gross weight at the limit load (two-thirds of ultimate load) condition for the design rating specified in 3.3;
- c) so that the permanent deformation is acceptable at the ultimate load.

3.2.4 Assembly construction

The net assembly shall be constructed so that it adequately encompasses the pallet load and attaches to fittings on all four edges of the pallet in accordance with ISO 8097.

3.2.5 Hardware

3.2.5.1 The net hardware shall be designed and constructed so that it can be easily operated in confined areas.

3.2.5.2 All hardware shall be securely attached to prevent it being lost.

3.2.5.3 Free ends that pass through adjusting buckles shall be equipped with stops.

3.2.5.4 Provision shall be made to enable the net to be tensioned evenly over the cargo. If a mechanical advantage facility is provided to achieve the tension, the release of the tensile force shall be achieved by an operating force not greater than 16 % of the tensioning force and it shall be possible to release the force using a gloved hand.

3.2.5.5 Pallet attachment fittings shall conform with ISO 7166.

3.2.6 Net mesh and configuration

3.2.6.1 The net design shall ensure a minimum installation time and shall be of a configuration such as to minimize the possibility of incorrect installation.

3.2.6.2 The net shall be constructed in such a manner that entanglement during installation and storage is minimized.

3.2.6.3 Nets shall be adequately treated to minimize shrinkage.

3.2.6.4 All netting ends shall be suitably prepared to prevent fraying.

3.2.6.5 The material used for netting shall meet the appropriate regulatory standards for polyamid or polyester and its treatment. If other materials are used, they shall meet equivalent standards for material and treatment.

3.2.6.6 If netting is made from polyamid, polyester or other textile material, consideration should be given to take account of strength degradation resulting from wear and exposure to ultraviolet radiation. See ISO/TR 8647.

3.2.6.7 Nets shall restrain load within the maximum allowable contours. See IATA *ULD Technical Manual*, 8th edition, specification 50/0, appendix D, or ISO 10046:—, figure 7.

3.2.6.8 The net mesh shall be capable of restraining boxes with dimensions of 250 mm × 300 mm × 300 mm (10 in × 12 in × 12 in).

3.2.7 Reefing adjustment

The net shall be constructed so as to provide adjustment in the vertical range from 610 mm (24 in) to a height of 3 m (118 in) or a height appropriate to the aircraft installation.

3.2.8 Colour

The colour of the net material and hardware shall be optional. However, contrasting colours may be used to distinguish net components for simplifying attachment of the net to the pallet.

3.2.9 Special marking

In addition to the marking requirements specified in clause 6, the net shall be clearly marked to facilitate rigging on the pallet. If the net operation is not omnidirectional, top and bottom, and inside and outside shall be indicated. Character markings or colour coding may be used to facilitate rapid attachment of net fittings to the pallet.

3.2.10 Weight limits

The tare weight of the net assembly shall be kept to a minimum consistent with the requirements and limits of sound design practices.

3.3 Ratings

The net shall be designed to restrain the gross weight³⁾ specified in table 2 when attached to the pallet according to the appropriate configuration shown in ISO 8097.

Table 2

Size code	Gross weight	
	kg	lb
A	6 804	15 000
B	4 536	10 000
K	1 588	3 500
L	3 175	7 000
M	6 804	15 000
R	11 340	25 000

NOTE — The sizes of the corresponding pallets are shown in table 1.

3.4 Performance requirements

3.4.1 The net assembly shall be tested to show compliance with the performance requirements specified in ISO 8097.

The net configuration shall be tested for each of the load and restraint conditions applicable to that configuration, unless the critical combination is beyond doubt, in which case the net need only be tested for the most critical conditions.

3.4.2 Alternatively, compliance with ISO 8097 may be proven by analytical methods.

3.5 Airworthiness

The airworthiness requirements specified in ISO 8097 shall be applicable.

4 Environmental criteria

4.1 Materials

4.1.1 The net design and construction should take into consideration environmental degradation which will occur over the service life. See ISO/TR 8647.

4.1.2 The structural and operational integrity of the net shall be maintained at temperatures from – 55 °C to + 70 °C (– 65 °F to + 160 °F).

4.1.3 All components of the net shall be protected against deterioration or loss of strength in service due

to weathering, corrosion or other causes where the type of material used requires such protection.

4.1.4 The net shall be designed so that it will withstand handling common to air/land freight terminal and ramp operations.

4.2 Materials and processes

4.2.1 In order to provide for maximum service life, consideration should be given to the materials and processes used in the construction to take into account the extremely hard usage to which the net will be subjected. All metal parts should be suitably protected against corrosion. All non-metallic materials which are liquid-absorbent should be sealed or treated to prevent liquid absorption.

4.2.2 The materials used shall be flame-resistant in accordance with appropriate regulatory requirements.

5 Production nets

In order to show compliance with its specification standard, commercial inspection, and quality control methods and practices shall be used to ensure that production units are not inferior to the article tested. Where changes are made to production units and product similarity cannot be clearly established, the first product so changed shall be retested to prove compliance with its specification.

6 Marking requirements

All nets covered by this International Standard shall be marked in accordance with the following requirements:

Manufacturer:	
(Name)	(Country)
Part number:	
Date of manufacture:	
Service life:	
Tare weight: kg lb	

The markings shall be shown on the outside of the net in such a manner that good readability is ensured under all phases of handling.

All weights shall be rounded off to the next highest 0,5 kg or full pound.

3) The term "weight" is used throughout this International Standard, instead of the correct technical term "mass", in order to conform to current commercial usage.

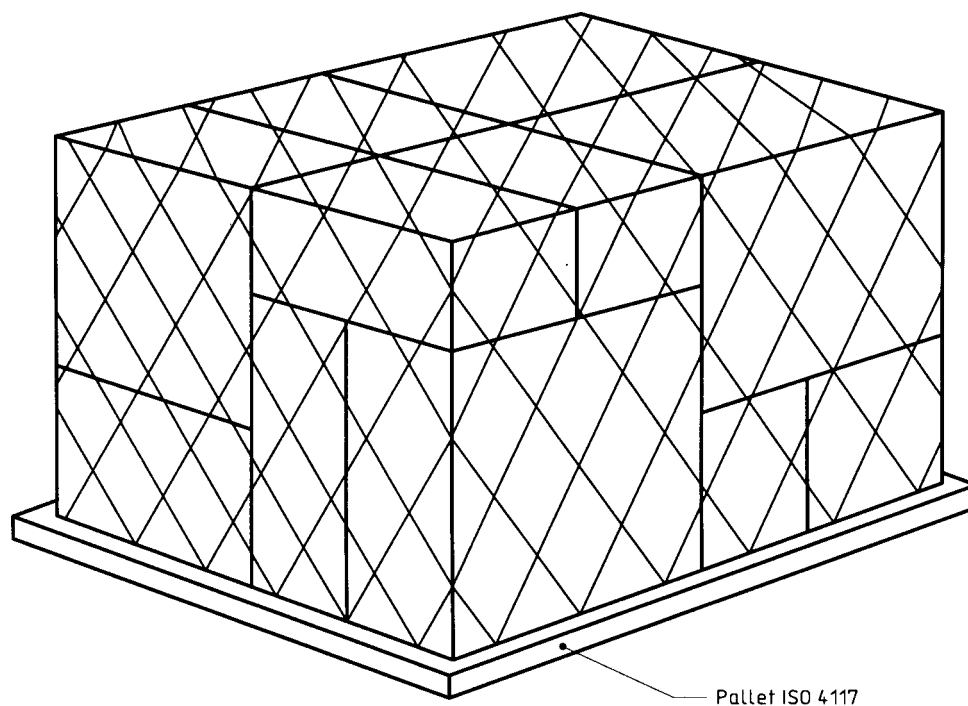


Figure 1 — Net assembly (typical design – pattern optional)

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No. : TED 14 (666).

Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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